

FORM PTO-1390 (REV 5-93)

U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371

13202.00377

U S APPLICATION NO

60/152,282

10/070165

INTERNATIONAL APPLICATION NO.

PCT/CA00/01001

INTERNATIONAL FILING DATE

1 September 2000 (01.09.00)

PRIORITY DATE CLAIMED

3 September 1999 (03.09.99)

TITLE OF INVENTION

FLUID TREATMENT SYSTEM, RADIATION SOURCE ASSEMBLY AND RADIATION SOURCE MODULE

APPLICANT(S) FOR DO/EO/US

TROJAN TECHNOLOGIES INC.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the application time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(I).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☒ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☒ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
14. ☐ A change of power of attorney and/or address letter.
15. ☒ Other : International Preliminary Exam. Report; Notif. Of Transmittal Of The International Search Report Or The Declaration; International Search Reported dated 1/25/01

U.S. APPLICATION NO.  
60/152,282

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INTERNATIONAL APPLICATION NO  
PCT/CA00/01001

ATTORNEY'S DOCKET NUMBER  
13202.00377

17. ☒ The following fees are submitted:

**Basic National Fee (37 CFR 1.492(a)(1)-(5):**

Search Report has been prepared by the EP or JPO ..... \$890.00  
International preliminary examination fee paid to USPTO  
(37 CFR 1.492(a)(1)) ..... \$000.00  
No international preliminary examination fee paid to USPTO (37 CFR 1.492  
(a)(1)) but international search fee paid to USPTO (37 CFR 1.492(a)(2)) ..... \$000.00  
Neither international preliminary examination fee (37 CFR 1.492(a)(1))  
nor international search fee (37 CFR 1.492(a)(2)) paid to USPTO ..... \$1,040.00  
International preliminary examination fee paid to USPTO (37 CFR 1.492  
(a)(4)) and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$000.00

**ENTER APPROPRIATE BASIC FEE AMOUNT =**

CALCULATIONS

PTO USE ONLY

\$1,930.00

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months  
from the earliest claimed priority date (37 CFR 1.492(e)).

\$

Claims	Number Filed	Number Extra	Rate
Total Claims	19 - 20 = 0		X \$18.00
Independent Claims	3 - 3 = 0		X \$84.00
Multiple dependent claim(s) (if applicable)			+ \$280.00

\$000.00

\$000.00

\$000.00

**TOTAL OF ABOVE CALCULATIONS =**

\$1,930.00

Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement  
must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).

\$ 965.00

**SUBTOTAL =**

\$ 965.00

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20  
☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)).

\$ 000.00

**TOTAL NATIONAL FEE =**

\$ 965.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be  
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

\$ 40.00

**TOTAL FEES ENCLOSED =**

\$1,005.00

Amount to be:

refunded \$

charged \$

a. ☐ A check in the amount of \$\_\_\_\_\_ to cover the above fees is enclosed.

b. ☒ Please charge my Deposit Account No. 50-1710 in the amount of \$ 1,005.00 to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 50-1710. A duplicate copy of this sheet is enclosed.

**NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

SEND ALL CORRESPONDENCE TO: Patent Administrator  
Richard P. Bauer, Katten Muchin Zavis

525 West Monroe Street, Suite 1600

Chicago, Illinois 60661-3693

Facsimile: (312) 902-1061

SIGNATURE

Richard P. Bauer

March 4, 2002

NAME

31,588

DATE

REGISTRATION NUMBER

13202.00377

PATENT APPLICATION

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: )  
: Examiner:  
RICHARD PEARCEY )  
: Group Art Unit:  
Application No.: NYA )  
:   
Filed: March 4, 2002 )  
:   
For: FLUID TREATMENT SYSTEM, ) March 4, 2002  
: RADIATION SOURCE )  
: ASSEMBLY AND RADIATION )  
: SOURCE MODULE )  
: )

Commissioner for Patents  
Washington, D.C. 20231

**PRELIMINARY AMENDMENT AND  
INFORMATION DISCLOSURE STATEMENT**

Sir:

Prior to examination on the merits, kindly amend the  
above-identified application as follows:

**IN THE CLAIMS:**

Please amend Claims by replacing them with the  
following Rewritten Claims. A copy of the Marked-Up Claims is  
attached for the Examiner's convenience.

#### Rewritten Claims

4. (Amended) The radiation source module defined in claim 1, wherein the frame further comprises a ballast for controlling the at least one radiation source.

5. (Amended) The radiation source module defined in claim 1, wherein the first support member comprises a hollow passageway for receiving a lead wire for conveying electricity to the at least one radiation source.

6. (Amended) The radiation source module defined in claim 1, wherein the protective sleeve comprises a quartz sleeve.

7. (Amended) The radiation source module defined in claim 1, wherein the radiation source module comprises a plurality of radiation source assemblies at least one radiation source assembly comprising the optical radiation sensor disposed within the protective sleeve.

9. (Amended) The radiation source module defined in claim 1, wherein the radiation source assembly comprises a plurality of radiation sources.

10. (Amended) The radiation source module defined in claim 1, wherein the optical radiation sensor is disposed adjacent one end of the protective sleeve.

13. (Amended) The radiation source assembly defined in claim 11, wherein the radiation source module comprises a plurality of radiation source assemblies at least one radiation source assembly comprising the optical radiation sensor disposed within the protective sleeve.

15. (Amended) The radiation source assembly defined in claim 11, wherein the radiation source assembly comprises a plurality of radiation sources.

16. (Amended) The radiation source assembly defined in claim 11, wherein the optical radiation sensor is disposed adjacent one end of the protective sleeve.

Marked-Up Version Of Claims

4. (Amended) The radiation source module defined in [any one of] claim[s] 1[-3], wherein the frame further comprises a ballast for controlling the at least one radiation source.

5. (Amended) The radiation source module defined in [any one of] claim[s] 1[-4], wherein the first support member comprises a hollow passageway for receiving a lead wire for conveying electricity to the at least one radiation source.

6. (Amended) The radiation source module defined in [any one of] claim[s] 1[-5], wherein the protective sleeve comprises a quartz sleeve.

7. (Amended) The radiation source module defined in [any one of] claim[s] 1[-6], wherein the radiation source module comprises a plurality of radiation source assemblies at least one radiation source assembly comprising the optical radiation sensor disposed within the protective sleeve.

9. (Amended) The radiation source module defined in [any one of] claim[s] 1[-8], wherein the radiation source assembly comprises a plurality of radiation sources.

10. (Amended) The radiation source module defined in [any one of] claim[s] 1[-9], wherein the optical radiation sensor is disposed adjacent one end of the protective sleeve.

13. (Amended) The radiation source assembly defined in [any one of] claim[s] 11[-12], wherein the radiation source module comprises a plurality of radiation source assemblies at least one radiation source assembly comprising the optical radiation sensor disposed within the protective sleeve.

15. (Amended) The radiation source assembly defined in [any one of] claim[s] 11[-14], wherein the radiation source assembly comprises a plurality of radiation sources.

16. (Amended) The radiation source assembly defined in [any one of] claim[s] 11[-15], wherein the optical radiation sensor is disposed adjacent one end of the protective sleeve.

### REMARKS

Claims 1-19 are pending in the application. Claims 1, 11, and 17 are independent.

Claims 4-7, 9-10, 13, 15 and 16 have been amended to correct their improper multiple dependency form.

### INFORMATION DISCLOSURE STATEMENT

In compliance with the duty of disclosure under 37 C.F.R. § 1.56 and in accordance with the practice under 37 C.F.R. §§ 1.97 and 1.98, the Examiner's attention is directed to the documents listed on the enclosed Form PTO-1449. Copies of the listed documents are enclosed for the Examiner's convenience.

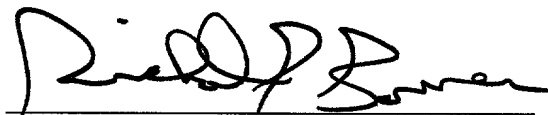
### CONCLUSION

It is respectfully requested that the below-listed information be considered by the Examiner and that a copy of the enclosed Form PTO-1449 be returned indicating that such information has been considered.



Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 625-3500. All correspondence should continue to be directed to our address given below.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Richard P. Zavis", written over a horizontal line.

Attorney for Applicants

Registration No. 31588

Patent Administrator  
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FLUID TREATMENT SYSTEM, RADIATION SOURCE  
ASSEMBLY AND RADIATION SOURCE MODULE

TECHNICAL FIELD

5 In one of its aspects, the present invention relates to a radiation source assembly. In another of its aspects, the present invention relates to a radiation source module comprising a novel radiation source assembly having incorporated therein an optical radiation sensor.

10 BACKGROUND ART

Optical radiation sensors are known and find widespread use in a number of applications. One of the principal applications of optical radiation sensors is in the field of ultraviolet radiation fluid disinfection systems.

It is known that the irradiation of water with ultraviolet light will disinfect  
15 the water by inactivation of microorganisms in the water, provided the irradiance and exposure duration are above a minimum "dose" level (often measured in units of microWatt seconds per square centimetre). Ultraviolet water disinfection units such as those commercially available from Trojan Technologies Inc. under the tradenames UV700 and UV8000, employ this principle to disinfect water for  
20 human consumption. Generally, water to be disinfected passes through a pressurized stainless steel cylinder which is flooded with ultraviolet radiation. Large scale municipal waste water treatment equipment such as that commercially available from Trojan Technologies Inc. under the trade-names UV3000 and UV4000, employ the same principal to disinfect waste water.  
25 Generally, the practical applications of these treatment systems relates to submersion of treatment module or system in an open channel wherein the wastewater is exposed to radiation as it flows past the lamps. For further discussion of fluid disinfection systems employing ultraviolet radiation, see any one of the following:

30

United States Patent 4,482,809,

United States Patent 4,872,980,

United States Patent 5,006,244,  
United States Patent 5,418,370,  
United States Patent 5,539,210, and  
United States Patent 5,590,390.

5

In many applications, it is desirable to monitor the level of ultraviolet radiation present within the water under treatment. In this way, it is possible to assess, on a continuous or semi-continuous basis, the level of ultraviolet radiation, and thus the overall effectiveness and efficiency of the disinfection process.

10

It is known in the art to monitor the ultraviolet radiation level by deploying one or more passive sensor devices near the operating lamps in specific locations and orientations which are remote from the operating lamps. These passive sensor devices may be photodiodes, photoresistors or other devices that respond to the impingent of the particular radiation wavelength or range of radiation wavelengths of interest by producing a repeatable signal level (in volts or amperes) on output leads.

15

Conventional ultraviolet disinfection systems often incorporate arrays of lamps immersed in a fluid to be treated. Such an arrangement poses difficulties for mounting sensors to monitor lamp output. The surrounding structure is usually a pressurized vessel or other construction not well suited for insertion of instrumentation. Simply attaching an ultraviolet radiation sensor to the lamp module can impede flow of fluid and act as attachment point for fouling and/or blockage of the ultraviolet radiation use to treat the water. Additionally, for many practical applications, it is necessary to incorporate a special cleaning system for removal of fouling materials from the sensor to avoid conveyance of misleading information about lamp performance.

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It would be desirable to have a radiation source assembly and module containing same which incorporated an optical radiation sensor that does not interfere with the flow of water or exposure of the fluid being treated to radiation.

DISCLOSURE OF THE INVENTION

It is an object of the present invention to provide a novel radiation source module which obviates or mitigates at least one of the above-mentioned disadvantages of the prior art.

5 It is another object of the present invention to provide a novel radiation source assembly which obviates or mitigates at least one of the above-mentioned disadvantages of the prior art.

10 Accordingly, in one of its aspects, the present invention provides a radiation source module for use of fluid treatment system, the module comprising:

a frame having a first support member;

at least one radiation source assembly extending from and in engagement (preferably sealing engagement) with a first support member, the at least one radiation source assembly comprising at least one radiation source disposed within a protective sleeve; and

15 an optical radiation sensor disposed within the protective sleeve.

In another of its aspects, the present invention provides a radiation source assembly for use in a radiation source module, the radiation source assembly comprising at least one radiation source and an optical radiation sensor, both the at least one radiation source and the optical radiation sensor being disposed within a protective sleeve.

20 In yet another of its aspects, the present invention provides a fluid treatment system comprising:

a fluid treatment zone;

25 at least one radiation source assembly disposed in the fluid treatment zone, the at least one radiation source assembly comprising at least one radiation source disposed within a protective sleeve; and

an optical radiation sensor disposed within the protective sleeve.

30 In a preferred embodiment of the fluid treatment system, the fluid treatment zone comprises a housing through which fluid flows. Preferably, the at least one radiation source assembly is secured to the housing.

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Thus, the present inventor has discovered that, by placing an optical radiation sensor within a protective sleeve commonly employed in combination with a radiation source, a number of advantages accrue. For example, the need to periodically clean the surface of the sensor from fouling materials is obviated since the sensor is disposed within the protective sleeve. This is particularly advantageous when the radiation source assembly is used in conjunction with a cleaning system (e.g., one of the cleaning systems in the '370, '210 and/or '390 patents referred to above). Specifically, since the cleaning system serves the purpose of removing fouling materials from the protective sleeve to allow for optimum dosing of radiation, a separate cleaning system for the sensor is not required. Further, since the optical radiation sensor is disposed within an existing element (the protective sleeve) of the radiation source module, incorporation of the sensor in the module does not result in any additional hydraulic head loss and/or does not create a "catch" for fouling materials. Other advantages will be apparent to those skilled in the art.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the present invention will be described with reference to the accompanying drawings, in which:

Figure 1 is a side elevation of an embodiment of the present radiation source module;

Figure 2 is a sectional view of a trio of radiation source modules including the radiation source module illustrated in Figure 1; and

Figure 3 illustrates an enlarged sectional view taken along line A-A in Figure 2.

#### BEST MODE FOR CARRYING OUT THE INVENTION

With reference to Figures 1-2, a radiation source module 100 is illustrated. Radiation source module 100 comprises a pair of support legs 105, 110 depending from a crosspiece 115. Disposed between support legs 105, 110 are a trio of radiation source assemblies 120, 125, 130. Each radiation source assembly 120, 125, 130 comprises a radiation source 140 (e.g., an ultraviolet emitting lamp)

-5-

disposed within a protective sleeve 145 (e.g., typically made of quartz). The design of support legs 105, 110 and radiation source assemblies 120 is preferably as is described in United States Patents 4,872,980 and 5,006,244 referred to hereinabove.

5            Preferably, each protective sleeve 145 is connected to support leg 105 via a coupling nut 150. The details of this connection are preferably as set out in copending United States patent application S.N. 09/258,142 (Trautenberg et al.).

10            With reference to Figures 2 and 3, radiation source assembly 125 comprises an optical radiation sensor 150 disposed within protective sleeve 145 adjacent support leg 110. Optical sensor 150 comprises a window 155 (optional) which receives incident radiation and passes this radiation into a body 160 that contains a photodiode (not shown) or other radiation sensor material as described above. A signal related to the amount of radiation sensed is then sent from body 160 through a lead 165 which is connected to a conventional control system  
15            which allows the user to ascertain the level of radiation sensed compared to a predetermined benchmark.

20            Preferably, sensor 160 is oriented within protective sleeve 145 in a manner that it receives incident radiation from at least one, preferably both, of adjacent radiation source assemblies 120, 130. In other words, it is preferred that sensor 150 not receive incident radiation from the radiation source contained within the same protective sleeve in which sensor 150 is housed.

             The sensor itself may be chosen from conventional sensors. For example, a suitable sensor is commercially available from UDT Sensors Inc. (Hawthorne, California).

25            As shown in Figure 2, radiation source module 100 may be a member of an array of radiation source modules which do not contain an optical radiation source sensor. Thus, the trio of radiation source modules illustrated in Figure 2 could be placed in an open channel as shown in United States Patents 4,872,980 and 5,006,244 and used to treat wastewater as set out in those patents.

30            While the present invention has been described with reference to preferred and specifically illustrated embodiments, it will of course be understood by those skilled in the arts that various modifications to these preferred and illustrated

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embodiments may be made without the parting from the spirit and scope of the invention. For example, while the present invention has been illustrated with reference to radiation source modules similar in general design to those taught in United States Patents 4,872,980 and 5,006,244, it is possible to employ the present radiation source assembly in a module such as the one illustrated in United States Patents 5,418,370 , 5,539,210 and 5,590,390 - i.e., in a module having a single support for one or more elongate source assemblies extending therefrom.. Further, it is possible to employ the present radiation source assembly in a fluid treatment device such as those commercially available from Trojan Technologies Inc. under the tradenames UV700 and UV8000. Still, further, while, in the embodiments illustrated and described above, the optical sensor is disposed at the end of the projective sleeve opposite the end where electrical connections for the lamp are located, it possible to locate the optical radiation sensor at the same end as the electrical connections for the lamp thereby allowing for use of the protective sleeve having one closed end. Still further, it is possible to utilize an optical radiation source sensor disposed between two radiation sources, all of which are disposed within a protective sleeve. Other modifications which do not depart from the spirit and scope of the present invention will be apparent to those skilled in the art.

All publications, patents and patent applications referred to herein are incorporated by reference in their entirety to the same extent as if each individual publication, patent or patent application was specifically and individually indicated to be incorporated by reference in its entirety.

What is claimed is:

1. A radiation source module for use of fluid treatment system, the module comprising:

5 a frame having a first support member;  
at least one radiation source assembly extending from and in engagement with a first support member, the at least one radiation source assembly comprising at least one radiation source disposed within a protective sleeve; and  
an optical radiation sensor disposed within the protective sleeve.

10

2. The radiation source module defined in claim 1, wherein the frame further comprises a second support member opposed to and laterally spaced from the first support member, the at least one radiation source assembly disposed between each of the first support member and the second support member.

15

3. The radiation source module defined in claim 2, wherein the frame further comprises a third support member interconnecting the first support member and the second support member.

20

4. The radiation source module defined in any one of claims 1-3, wherein the frame further comprises a ballast for controlling the at least one radiation source.

5. The radiation source module defined in any one of claims 1-4, wherein the first support member comprises a hollow passageway for receiving a lead wire  
25 for conveying electricity to the at least one radiation source.

6. The radiation source module defined in any one of claims 1-5, wherein the protective sleeve comprises a quartz sleeve.

30

7. The radiation source module defined in any one of claims 1-6, wherein the radiation source module comprises a plurality of radiation source assemblies at



-8-

least one radiation source assembly comprising the optical radiation sensor disposed within the protective sleeve.

8. The radiation source module defined in claim 7, wherein the radiation source module comprises at least one radiation source assembly having no optical radiation sensor.

9. The radiation source module defined in any one of claims 1-8, wherein the radiation source assembly comprises a plurality radiation sources.

10. The radiation source module defined in any one of claims 1-9, wherein the optical radiation sensor is disposed adjacent one end of the protective sleeve.

11. A radiation source assembly for use in a radiation source module, the radiation source assembly comprising at least one radiation source and an optical radiation sensor, both of the at least one radiation source and the optical radiation sensor being disposed within a protective sleeve.

12. The radiation source assembly defined in claim 11, wherein the protective sleeve comprises a quartz sleeve.

13. The radiation source assembly defined in any one of claims 11-12, wherein the radiation source module comprises a plurality of radiation source assemblies at least one radiation source assembly comprising the optical radiation sensor disposed within the protective sleeve.

14. The radiation source assembly defined in claim 13, wherein the radiation source module comprises at least one radiation source assembly having no optical radiation sensor.

15. The radiation source assembly defined in any one of claims 11-14, wherein the radiation source assembly comprises a plurality of radiation sources.

16. The radiation source assembly defined in any one of claims 11-15, wherein the optical radiation sensor is disposed adjacent one end of the protective sleeve.

5

17. A fluid treatment system comprising:  
a fluid treatment zone;  
at least one radiation source assembly disposed in the fluid treatment zone, the at least one radiation source assembly comprising at least one radiation source disposed within a protective sleeve; and  
an optical radiation sensor disposed within the protective sleeve.

10

18. The fluid treatment system defined in claim 17, wherein the fluid treatment zone comprises a housing through which fluid flows.

15

19. The fluid treatment system defined in claim 18, wherein the at least one radiation source assembly is secured to the housing.

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
15 March 2001 (15.03.2001)

PCT

(10) International Publication Number  
**WO 01/17906 A1**

(51) International Patent Classification<sup>7</sup>: C02F 1/32

(74) Agents: NASSIF, Omar, A. et al.; Gowling, Strathy & Henderson, Suite 4900, Commerce Court West, Toronto, Ontario M5L 1J3 (CA).

(21) International Application Number: PCT/CA00/01001

(22) International Filing Date:  
1 September 2000 (01.09.2000)

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(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/152,282 3 September 1999 (03.09.1999) US

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*): TROJAN TECHNOLOGIES INC. [CA/CA]; 3020 Gore Road, London, Ontario N5V 4T7 (CA).

**Published:**

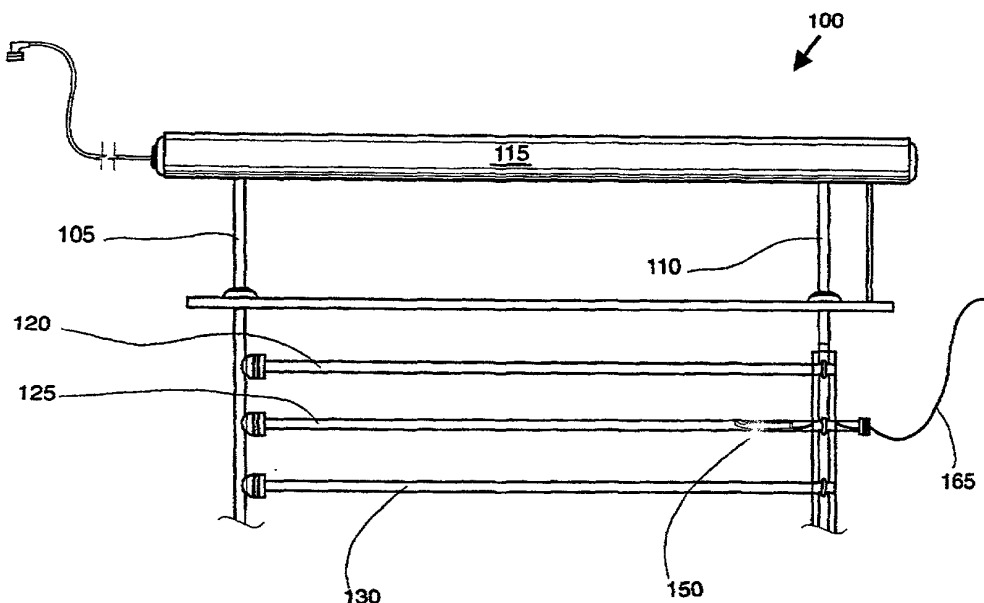
- With international search report.
- Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): PEARCEY, Richard [CA/CA]; 9 Dengage Crescent, London, Ontario N5W 1V7 (CA).

[Continued on next page]

(54) Title: FLUID TREATMENT SYSTEM, RADIATION SOURCE ASSEMBLY AND RADIATION SOURCE MODULE



(57) Abstract: A radiation source module for use of fluid treatment system. The radiation source module comprises: a frame (105) having a first support member; at least one radiation source assembly (125) extending from and in engagement with a first support member, the at least one radiation source assembly comprising at least one radiation source disposed within a protective sleeve; and an optical radiation sensor (150) disposed within the protective sleeve. The radiation source module is particularly useful in ultraviolet radiation treatment systems used to disinfect wastewater.

WO 01/17906 A1

Figure 1

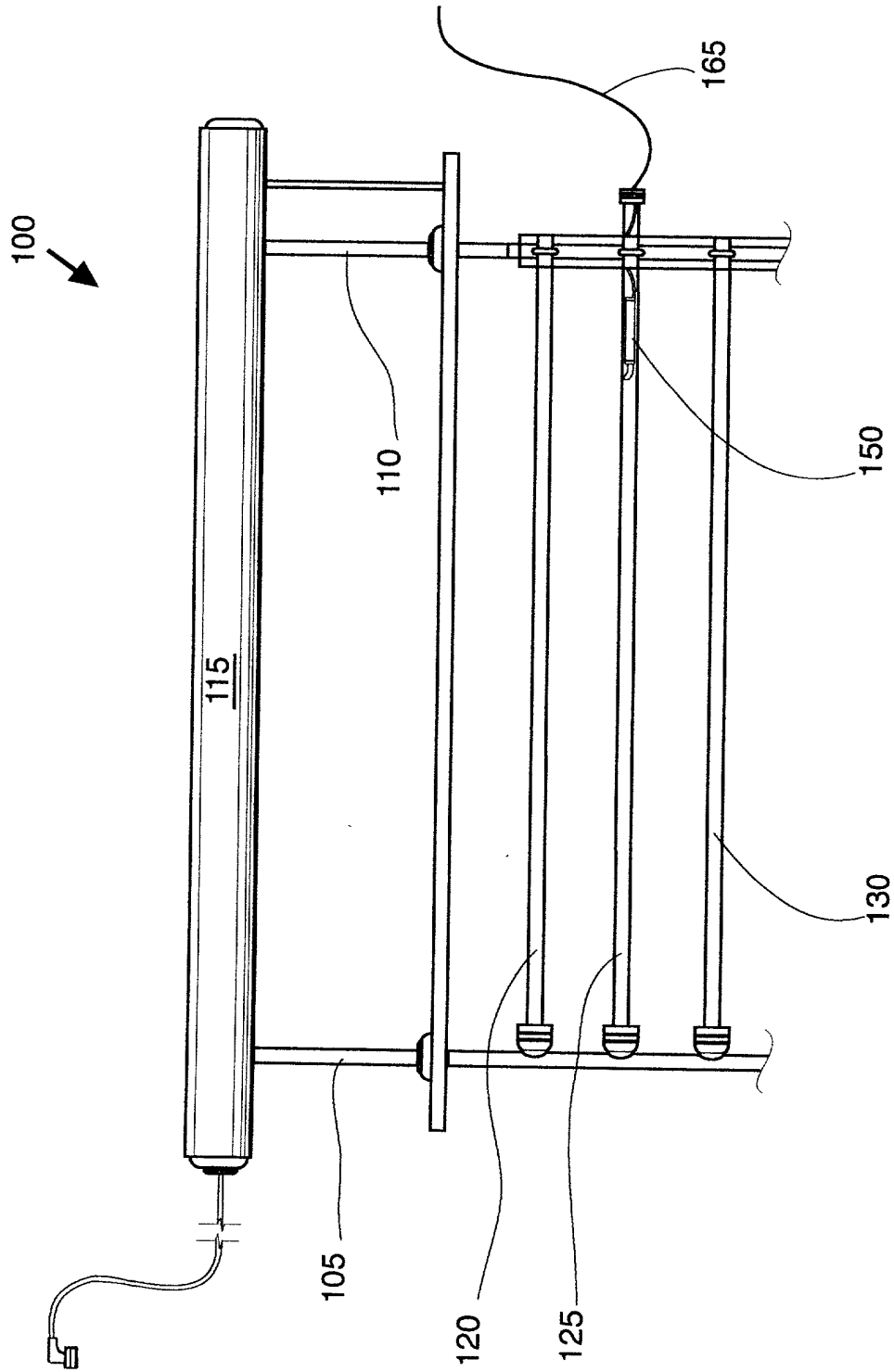


Figure 2

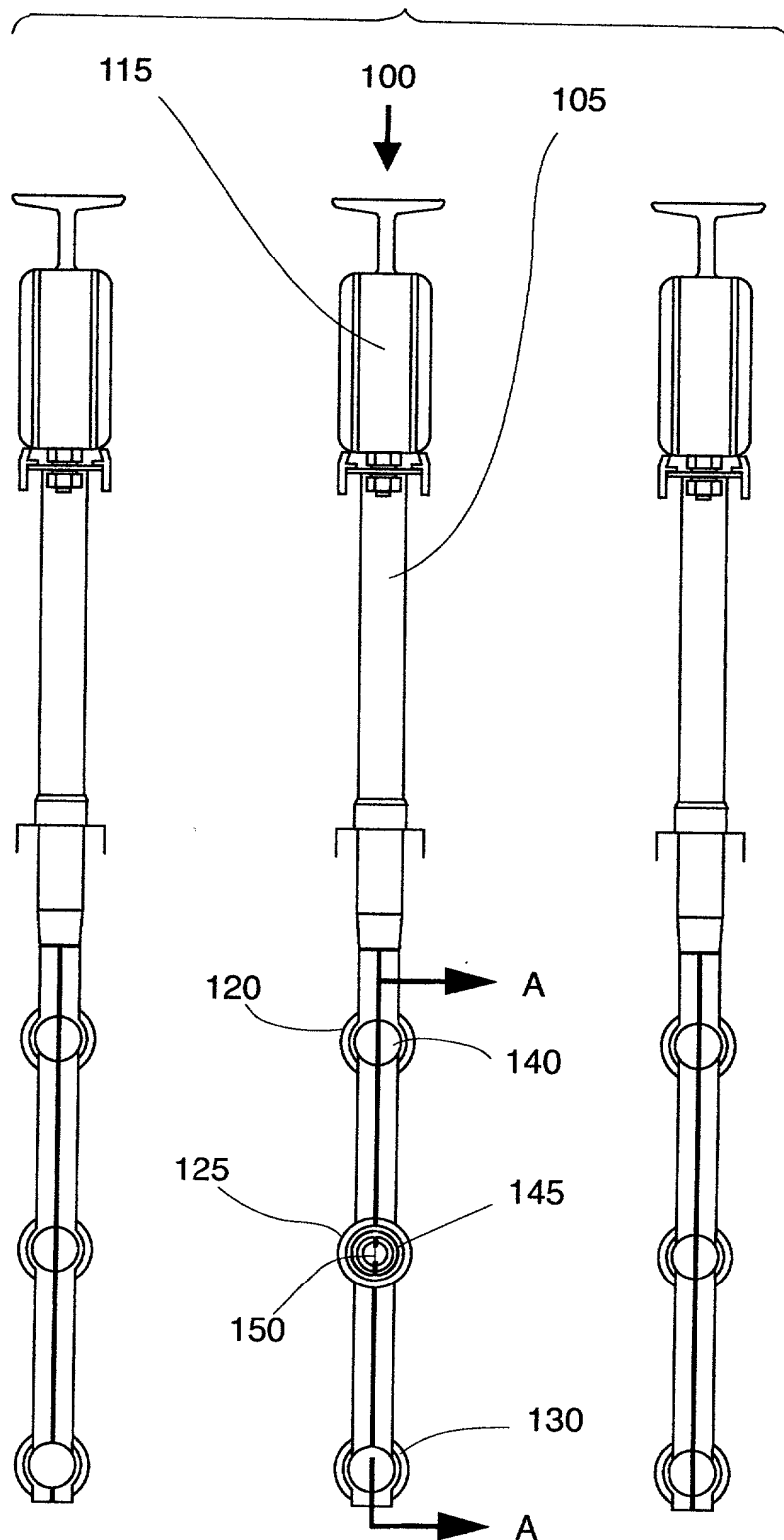
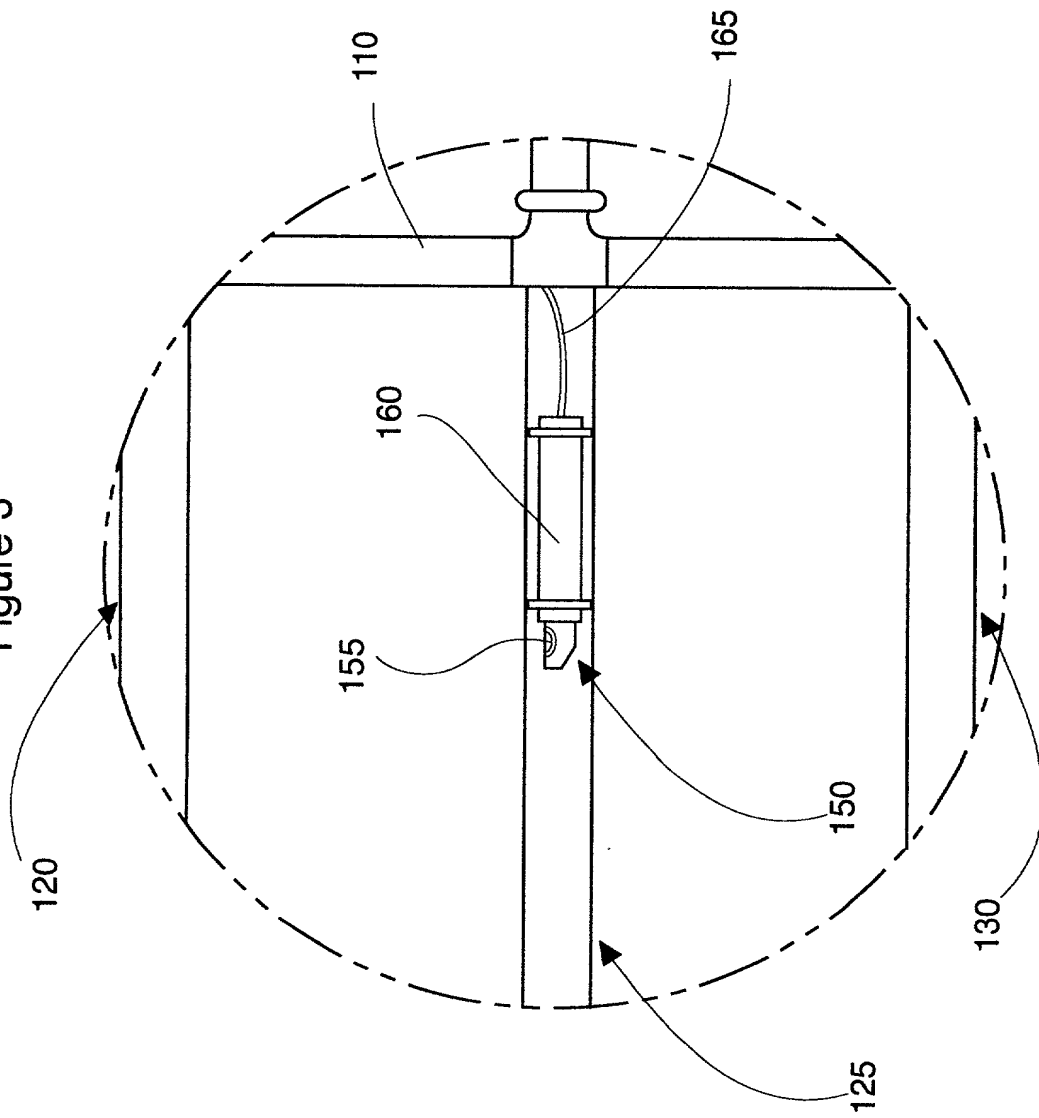


Figure 3



# **COMBINED DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION**

(Page 1)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled FLUID TREATMENT SYSTEM, RADIATION SOURCE ASSEMBLY AND RADIATION SOURCE MODULE the specification of which ☐ is attached hereto ☒ was filed on September 1, 2000 as United States Application No. \_\_\_\_\_ or PCT International Application No. PCT/CA00/01001 and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b), of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designates at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT international application having a filing date before that of the application on which priority is claimed:

<u>Country</u>	<u>Application No.</u>	<u>Filed (Day/Mo./Yr.)</u>	<u>(Yes/No) Priority Claimed</u>
WO	PCT/CA00/01001	01 September 2000	Yes

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

<u>Application No.</u>	<u>Filed (Day/Mo./Yr.)</u>
60/152,282	03 September 1999

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or § 365(c) of any PCT international application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior

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FOR PATENT APPLICATION**

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United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Status

Application No.      Filed (Day/Mo./Yr.)    (Patented, Pending, Abandoned)

I hereby appoint the practitioners associated with the firm and Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to the address associated with that Customer Number:

**KATTEN MUCHIN ZAVIS**  
**Customer Number: 27160**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole or First Inventor Richard Pearcey

Inventor's signature [Signature]

Date February 27, 2002

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